Intermediating policy for transitions towards net-zero energy buildings

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Abstract

The roles of intermediaries in sustainability transitions are increasingly recognised. How intermediaries advance transitions vis-a-vis public policy has, however, received little attention. Thus, we create an analytical framework of intermediating policy processes, drawing from transition and policy cycle literatures. We apply this to investigate two policy processes pertaining to Finland's building energy efficiency. The findings show how the central role of the Ministry of the Environment and high political attention have reduced the need for intermediation by external organisations in agenda setting and policy formulation. However, intermediaries external to the Ministry have been vital in facilitating policy implementation. The cases show that facilitating training as an intermediary activity can be undertaken by different organisations, such as a trade union, a government agency or an education committee. Based on our analysis, we argue that, when political attention on transitions is low, the need for intermediary action is likely to be higher.

Key words: intermediaries; energy efficiency; buildings; climate change mitigation; sustainability transitions; policy cycle

1. Introduction

Literature on intermediaries in sustainability transitions has recently proliferated (Gliedt et al., 2018). In this literature, 'transition intermediaries' are regarded as actors and platforms that positively affect sustainability transition processes by connecting diverse actors and activities, including their skills, resources and expectations (Kivimaa et al., 2019a). Such intermediaries have been noted to range from intermediaries focused on advancing specific innovation niches (i.e. niche intermediaries) to those operating across niches and socio-technical regimes, on a systemic level rather independently (i.e. systemic intermediaries) or institutionally-tied to established regimes (i.e. regime-based transition intermediaries) (Kivimaa et al., 2019a). Much attention has been paid to how intermediaries can connect distributed experiments (Geels and Deuten, 2006; Hargreaves et al., 2013) and work across different levels, scales and contexts (Hodson et al., 2013). While knowledge-based policy intermediation has received much interest in literature (e.g. Runhaar and van Nieuwaal, 2010; Michaels, 2016; Ramos-Mejía et al., 2018), other types of intermediation in policy development have been less explored, especially in connection to sustainability transitions.

The need to reorient public policy to support sustainability transitions is increasingly recognised (e.g. EEA, 2017, 2019), through providing a 'protective space' for niche alternatives (e.g. Smith and Raven, 2012; Lockwood, 2016) and by 'destabilising' unsustainable socio-technical systems (e.g. Kivimaa and Kern, 2016; Rogge and Johnstone, 2017). However, little attention has been devoted to how intermediaries are part of potentially transformative policy processes. Here, we will address this research gap by connecting intermediary functions to the policy cycle model. We create an analytical framework on *intermediating in the policy interface* and use it to empirically analyse two exemplary policy processes pertaining to building energy efficiency in Finland.

With respect to public policy, transition intermediaries comprise a range of public and private organisations with varying mandates and goals (Kivimaa and Martiskainen, 2018; Mignon and Kanda, 2018). They can be distinguished from other types of intermediaries by the activities they take to pursue or support sustainable solutions. In this paper, we adopt the Bracken and Oughton (2013) perspective on intermediaries, which acknowledges the strategic visioning and political manoeuvring roles alongside knowledge brokering.

When policy change is being negotiated and formulated, intermediaries may be needed for articulating the visions, expectations and needs of different stakeholders, particularly if ignorance or resistance is present (Rivera et al., 2009; Jokinen et al., 2016). At the implementation stage, intermediation can provide channels for learning, knowledge sharing, experimenting, and resource mobilisation, reaching out to the target groups, such as companies, citizens and local authorities (Primmer, 2011; Clarke and Ramirez, 2014; Ståhl et al., 2015). When transition-oriented policies are being evaluated, intermediaries might shape the knowledge generation and learning processes (Saarela et al., 2015). We argue that a distinction can be made between intermediating 'upwards' to influence agenda setting and policy formulation and intermediating 'downwards' to ensure implementation of policies in a way that accelerates transitions (Figure 1). Policy evaluation can address both directions by feeding into agenda setting, new policy formulation and the processes through which policies are implemented and adjusted. We elaborate this analytical framework in Section 2 and apply it in our empirical analysis in Section 4.

[Insert Figure 1 here]

We use the analytical framework to examine two policy processes pertaining to the nearly zero energy buildings transition in Finland: the renewal of energy efficiency requirements in building regulations in 2012, and the renovation strategy 2007-2017. Using interview data from December 2018-February 2019 and supplementary documents, we analyse the presence and functions of intermediary actors in these policy processes. More specifically, we ask (1) what functions do intermediary actors adopt when they intermediate for transitions at different stages of the policy cycle, and (2) how influential have intermediaries been in Finland's building energy efficiency transition? Our empirical analysis unravels what opportunities and needs for intermediation have arisen and how intermediaries have acted at different stages of the policy processes.

In Section 2, we introduce the analytical foundations of the study and the research design with the policy cycle model and intermediation in sustainability transitions. In Section 3, we describe the research

approach and methods, and in Section 4 we report our observations on intermediation in two policy processes. The findings are discussed in Section 5 and concluded in Section 6.

2. Intermediation engaging with policy processes for sustainability transitions

Previous literature on intermediaries in sustainability transitions has drawn specifically from studies on innovation intermediaries (Howells, 2006; Steward and Hyysalo, 2008) and urban transitions (Hodson and Marvin, 2009, 2010). While some links have been made to public policy and governance (Moss, 2009; Backhaus, 2010; Mignon and Kanda, 2018), the focus in this literature has been on intermediation and the range of roles taken to support niche development (e.g. Hargreaves et al., 2013; Seyfang et al., 2014). The acceleration of transitions requires increasing attention to policy change and how this is intermediated. To deepen the understanding of intermediary functions at different stages of policy process, we analyse the interface of intermediation in sustainability transitions and policymaking, using the policy cycle model. This allows us to create an analytical framework of intermediary functions in each step of the policy cycle.

To inform the analytical framework, we will first introduce the policy cycle model and then review the literature on intermediaries in sustainability transitions. We will tease out functions with potential relevance to each step of the policy cycle from the transition intermediaries' literature.

2.1 Policy cycle

The idea of a policy cycle, with a sequence of stages, has been a core influence for policy analysis since the 1950s. Scholars have presented slightly differing formulations, but the commonly recognised model includes four stages: (1) agenda setting, (2) policy formulation and decision-making, (3) implementation and (4) evaluation (see Table 1). The policy cycle model has been criticised regarding its theoretical construction (Jann and Wegrich, 2007). However, despite the real-world policymaking not always proceeding in a systematic sequence, the policy cycle model offers a helpful conceptualisation. It is one of the most extensively used frameworks "to organize and systemize the research on public policy", focusing attention on generic features of the policy process (Jann and Wegrich, 2007: 45).

Table 1: Stages of the policy cycle, following Jann and Wegrich (2007)

Policy cycle stages	**Description**
Agenda setting	This stage is described by topics and problems raised by government officials, and actors close to the government (Kingdon, 1995). The agenda can be constantly under attempts of influence, resulting in the issue getting on the formal political agenda (Jann and Wegrich, 2007). This influence is achieved, e.g., through gaining media attention or direct interaction with decision makers.
Policy formulation & decision-making	This stage includes the formulation of the issue into particular policy objectives, and possibly into policy programmes and instruments. Civil servants in ministries and decision makers in parliaments are relevant actors in this stage (Jann and Wegrich, 2007). It results in the formal decision to be implemented.
Implementation	This stage involves decisions regarding implementing organisations, human and financial resources needed, and how implementation processes will be carried out (Jann and Wegrich, 2007). The activities on the implementation stage, such as obligations and resource allocations, are often influenced by public administration, the private sector and possibly other intermediaries. For example, in Finland, lack of monitoring and sanctions limit the influence of building regulations on energy efficiency (Kivimaa et al., 2017).
Evaluation and termination	At this stage, policies are evaluated by assessing their impacts ex-post against set goals, sometimes paying attention to unintended impacts and considering the counterfactual factors (Mickwitz, 2003, Ferraro, 2009). New emerging science-driven or societal concerns and goals can also trigger policy evaluation (Jokinen et al., 2016).

The policy cycle has also been used for distinguishing the roles that different actors potentially take at different stages of the policy process (Rivera et al, 2009; Howlett et al., 2017). We use it here to differentiate functions that transition intermediaries might undertake with respect to policymaking. Based on a literature review on intermediaries in transitions, Table 2 provides our analytical framework of potential intermediary functions in each stage of the policy cycle. For the function of policy evaluation, our proposition is tentative as this was not covered in the published literature. Our categorisation is instructive, as in reality, for example, experimentation is likely to continue to the implementation stage and contribute to policy feedback. In addition, the multiplicity of different ongoing policy processes with

different temporalities is likely to maintain some functions over the different policy stages. In Sections 2.2-2.5, we go through intermediation in each stage based on insights from the literature.

Table 2: A conceptual framework of transition intermediary functions in the policy cycle

	Agenda setting	***Policy formulation and decision-making***	***Implementation***	***Evaluation,*** *tentative proposition*
Functions by intermediaries	**Aggregating expectations, knowledge and learning**, and articulating this to policymakers (Seyfang et al., 2014; Hamilton et al., 2015) **Creating a 'common voice'**; networking, translating and aligning interests (Backhaus, 2010; Smith et al., 2016; Bush et al., 2017) **Advocating for new visions**; demonstrating benefits of a niche, increasing awareness of opportunities, or mobilising political programmes (Kivimaa, 2014; Bush et al., 2017) **Brokering relevance for policy discourses**; facilitating policy dialogue, aiming for policy reform (Smith et al., 2016) **Facilitating experimentation**; creating support for and calls for social experiments pertaining to agenda setting (Kivimaa, 2014; Bush et al., 2017)	**Aggregating expectations, knowledge and learning**, and articulating this to policymakers (Seyfang et al., 2014; Hamilton et al., 2015) **Strengthening the 'common voice'**; networking, translating and aligning interests (Backhaus, 2010; Smith et al., 2016; Bush et al., 2017) **Influencing preferences for policy options**; advocating through voluntary standards, initiatives or experiments to pave the way; affecting policy priorities (Hamilton et al., 2015; Smith et al., 2016; Kivimaa & Martiskainen, 2018) **Influencing the design of policy instruments**, through aggregating, expectations, knowledge and learning (Kivimaa, 2014; Polzin et al., 2016; Kivimaa & Martiskainen, 2018) **Facilitating experimentation**; creating support for and calls for social experiments pertaining to policy formulation (Kivimaa, 2014; Bush et al., 2017)	**Coordinating policy implementation**; developing targeted networks, promoting mutual understanding and shared responsibility (Bracken & Oughton, 2013) **Translating and interpreting policy into practice**; providing advice and guidance of (complex) policy to stakeholders (Fischer & Guy, 2009; Moss, 2009; Rohracher, 2009; Hodson & Marvin, 2010; Hampton, 2018) **Enabling access to public finance**; solving administrative barriers, making connections to supportive instruments (Polzin et al., 2016; Bush et al., 2017) **'Selling the policy' to its target recipients**; encouraging participation, emphasising concrete benefits (Hampton, 2015) **Trust building and conflict resolution**, mediation of tensions, social learning (Kampelmann et al., 2016)	**Intermediating for broader policy evaluations** pertaining to transitions **Conducting alternative policy evaluations** **Aggregating different stakeholder perspectives** for policy evaluations and feedback (Huitema et al., 2011) **On-the-ground experimentation providing policy feedback** regarding how policy and its implementation work

2.2 Intermediation for agenda setting

In the agenda setting stage, we recognise the 'upward' influence of intermediary organisations towards policymaking through activities connecting other actors, their visions, learning and expectations to policymakers. Established regime intermediaries, such as industrial associations or trade unions, are likely to have a visible presence in the agenda setting stage, and transition intermediaries need to compete with them for policymakers' attention. In the early phase of transitions, intermediaries aggregating knowledge and awareness from niches to policymakers are relevant. If agenda setting is

about accelerating transitions, also systemic and regime-based transition intermediaries are likely to play a role.

Niche development studies note how intermediary organisations aggregate learning and experiences from local projects and experiments, repackage them for implementation elsewhere, and lobby for support from policy and industry (Seyfang et al., 2014; Hamilton et al., 2015). This is not an easy activity as intermediaries struggle with resource constraints and frequently changing policy context, which create a need for the intermediaries to repackage their activities for each new policy change and funding opportunity (Seyfang et al., 2014). Not all intermediation explicitly aims for policy influence. While some niche intermediaries mobilise political programmes (Smith et al., 2016), others can influence indirectly if policymakers follow their activities (Kivimaa and Martiskainen, 2018). In UK community energy, intermediaries have been shown to lobby policy makers to ensure that future policy developments support the community energy sector (Hargreaves et al., 2013).

Many studies of transition intermediaries follow the three core processes of strategic niche management (SNM) - articulation of expectations and visions, networking, and learning - with some amendments and elaborations, particularly pertaining to activities going beyond niche support (e.g. Kivimaa, 2014; Bush et al., 2017). For example, Bush et al. (2017) identify activities, such as increasing (local) awareness of opportunities that can be seen relevant for the agenda setting stage. Smith et al. (2016) describe activities, such as disseminating best practice, developing toolkits, facilitating experiments, and standardising and institutionalising the niche – potentially feeding into agenda setting and policy formulation. Moreover, intermediaries may also undertake policy advocacy by brokering relevance for policy discourses, facilitating policy dialogue, aiming for policy reform, and mobilising political programmes (Smith et al., 2016). Systemic intermediaries (van Lente et al., 2003) have the capacity to articulate a range of alternative options regarding the ways in which policy and markets for a more sustainable socio-technical system could operate (Kivimaa, 2014).

An important intermediation task is creating a common voice between different actors towards policymaking (Smith et al., 2016) to gain influence in agenda setting. For example, in the context of demand side management, Backhaus (2010) notes translating and aligning interests to facilitate the establishment common targets as an intermediary function. Similarly, Bush et al. (2017) identify aligning interests and establishing cooperation. This fitting together of interests for the creation of new policy visions and more concrete policy instrument suggestions is needed both among niche actors and in between niche and regime actors.

To sum up, we propose five core functions for intermediation in the agenda setting stage:

- Aggregating expectations, knowledge and learning, and articulating this to policy makers
- Creating a ‘common voice’ by networking, translating and aligning interests
- Advocating for new visions
- Brokering relevance for transformation in policy discourses and aiming for policy reform
- Facilitating experimentation and creating support for social experiments pertaining to agenda setting

We argue that these functions can be undertaken either by niche intermediaries, from the perspective of niches, or by broader regime-based transition intermediaries or systemic intermediaries aiming to change regimes from within and at the cross-section of multiple niches.

2.3 Intermediation for policy formulation and decision-making

To influence policy formulation and decision-making, transition intermediaries interact with and influence regimes more than in agenda setting. Also, in policy formulation, intermediation requires aggregating expectations and learning from stakeholders and their niche activities to strengthen a common ‘voice’ towards policymakers to advance transitions. Further, intermediary activities at this stage can include disseminating experiences from pilot projects and best practice through case studies to show what is technically possible and creating voluntary standards to pave way for mandatory ones. For example, in the UK, the National Energy Action, a non-state intermediary, developed the National Home Energy Rating Scheme that created pressure for the government to develop Standard Assessment Procedure for assessing the energy performance of buildings, later taken into use as part of building regulations

(Kivimaa and Martiskainen, 2018). Similar attempts have been made in UK community energy (Smith et al., 2016). The UK also demonstrates empirical examples of non-state intermediary organisations lobbying for the Climate Change Act (Hamilton et al., 2015).

Both state-affiliated and non-state intermediary organisations may take on the function of influencing the design of policy instruments. Polzin et al. (2016: 40) described an example, where innovation agencies "critically positioned between policymakers and industry" work to review and extend existing regulations and design new research and development programmes. Kivimaa (2014), in turn, showed how a state-affiliated intermediary played an active role in renewing policy instruments in place. In the UK, new intermediaries, such as the UK Green Building Council, have been established partly to lobby specific policy designs for energy efficiency (Kivimaa and Martiskainen, 2018).

A range of organisations can take roles in intermediating for policy formulation, including state or local authority agencies, hired consultancies, charities or NGOs. As in agenda setting, these can advocate specific niches or be more focused on regime change at the cross-section of multiple niches and regimes.

Here, we propose five core functions for intermediation in policy formulation and decision-making that partly overlap with those in agenda setting:

- Aggregating expectations, knowledge and learning, and articulating this to policymakers
- Strengthening the 'common voice by networking, translating and aligning interests
- Influencing preferences for policy options and affecting policy priorities
- Influencing the design of policy instruments
- Facilitating experimentation and creating support for social experiments pertaining to policy formulation and decision-making

We assume that the access of niche intermediaries to influence policy options or design of policy instruments is likely to be limited. Thus, regime-based transition intermediaries and systemic intermediaries are needed.

2.4 Intermediation for implementation

The implementation stage connects to the 'downward' influence of intermediaries to facilitate the operationalisation of transition-supporting policies, so that they conform to or transform the regime (cf. Smith and Raven, 2012). This can be conducted either by public sector intermediaries (e.g. state or city affiliated intermediaries) or private sector intermediaries (civil society or business intermediaries). While the former are significantly regime-based or systemic intermediaries, the latter can include also niche intermediaries.

Importantly, intermediaries have been described to translate novel regulations into practice (Moss, 2009). For example, Fischer and Guy (2009) find that architects alongside consultants and engineers intermediate in the building sector to translate complex building regulations. The change in how buildings are regulated have in effect created an opportunity for architects to reinvent themselves as interpretive intermediaries, deducing how to transform 'textual' regulatory requirements into building practice (Fischer and Guy, 2009).

More broadly, intermediaries can advise or even 'sell' new policies to stakeholders. Hampton (2018) describes how low-carbon innovation support was provided by energy advisors, through publicly funded programmes, to small and medium sized enterprises (SMEs). His study of energy advisors shows that they engage in selling the concept and funding to SMEs, through a process that requires effective 'sales skills' and where the energy advisor often possesses strong environmental motivations but needs to downplay them when engaging with the SMEs. Further, he draws attention to intermediaries offering options to improve energy efficiency by communicating the environmental benefits of these options, sometimes in a tailored fashion.

Another, related setting for intermediating policy implementation is mobilising public finance. Polzin et al. (2016) show how intermediaries channel public funds to R&D projects that have faced administrative barriers. Their analysis shows how intermediaries effectively accelerate the commercialisation of eco-

innovations by “managing strategic R&D partnerships and by making connections to supportive innovation policy instruments such as roadmaps, strategic public procurement or production support measures…” (Polzin et al., 2016: 41). Enabling access to (low-cost) finance also applies in other policy contents, such as district heating (e.g. Bush et al., 2017) or other forms of low-carbon technology.

Multiple intermediation functions play a role in implementation beyond translating and selling. In freshwater conservation, Bracken and Oughton (2013) find the strategic intermediary role of professionals crucial to policy implementation. They show how an administrator can take intermediary functions that exceed those of a knowledge broker: negotiating and bridging key agencies with resources and power to form a strategic network of relationships to support the policy. They argue that an intermediary “uses their strategic vision and undertakes political manoeuvring following the presentation and interaction of different knowledges and evidence to ensure a certain course of action”.

Non-state actors can also provide important intermediary services for policy implementation. Examples cover especially the role of providing advice that links to using public funds to improve energy efficiency, install renewable energy or make sense of labelling schemes (Rohracher, 2009; Hodson and Marvin, 2010; Hampton, 2018). For example, NGOs providing guidance and transparency for consumers, who are overwhelmed by heterogeneous and often non-transparent green electricity offers (Rohracher, 2009), intermediate the implementation of green labelling schemes.

A study of intermediation in urban regeneration programmes in Belgium reveal a further intermediary function in policy implementation. Kampelmann et al. (2016) discovered the successful mediation of tensions between public administration and community-based actors, linking to trust building and conflict resolution.

We propose five core functions for intermediation in the policy implementation stage:

- Coordinating policy implementation
- Translating and interpreting policy into practice
- Enabling access to public finance
- ‘Selling the policy’ to its target recipients
- Trust building and conflict resolution

We assume that niche intermediaries are important actors in translation, enabling access to finance and selling policy to target recipients alongside other types of transition intermediaries. Systemic intermediaries are likely to be important and relatively neutral actors for trust building and conflict resolution, while regime-based transition intermediaries have a role to play especially in coordinating policy implementation.

2.5 Intermediation for policy evaluation

The literature on intermediating sustainability transitions does not explicitly address functions related to policy evaluation. This might be due to the future orientation of the transitions literature. Policy evaluation might be considered a technical stage where less engagement and intermediation are needed. Alternatively, it might be considered an analytically challenging exercise (Magro and Wilson, 2013) that requires intermediation. The evaluation literature recognises the need for reflexivity and engagement that puts the evaluators in a less technical and more facilitating intermediary role, bringing in the views of different stakeholders (Huitema et al., 2011). Yet, a review of climate policy evaluations shows that this approach remains in a minority (Huitema et al., 2011). In an analysis of argumentation at different stages of policy cycle, Jokinen et al. (2017) show that evaluation is not debated in ways comparable with other stages of the policy process.

Considering transitions represent complex phenomena involving more actors than the traditional policymaking processes, we, thus, suggest that state agencies need certain intermediary qualities to conduct policy evaluations in a sufficiently inclusive and broad manner. Further, non-state intermediaries can provide alternative evaluations to those commissioned formally by policymakers.

Informally, on-the-ground experimentation can, in this stage, provide mechanisms for policy feedback, in terms of whether the policy is having desired effects on niche innovation and diffusion. Further,

experimentation in the evaluation stage may enable reframing the policy issues and influence the agenda setting of the subsequent policy cycle. For example, a positive evaluation of the impacts of an innovative market-based biodiversity conservation policy instrument led to institutionalising the instrument but the administrative norms have shown to constrain the transition to a market-like mind-set (Primmer et al., 2013), illustrating that there might be more room for intermediation.

Due to the lack of literature on intermediation in evaluation, our proposition is limited to four tentative functions:

- Intermediating for broader policy evaluations pertaining to transitions
- Conducting alternative policy evaluations
- Aggregating different stakeholder perspectives for policy evaluations and feedback
- On-the-ground experimentation providing policy feedback, via intermediaries, regarding how policy and its implementation work

In the following, we describe the empirical research approach and then move on to the analysis of the empirical cases.

3. Research methods and data

Our research approach was a qualitative case study analysis of two policy processes. We identified two relatively successful processes based on previous research [references removed for blind review]: the renewal of energy efficiency requirements in building regulations in 2012 and the building renovation strategy 2007-2017. The selection was made to choose two completed policy processes, with potentially the largest impact on building energy efficiency, and to cover both existing and new building stock.

Structured data collection was carried out during December 2018 - February 2019 to systematically analyse intermediation in the selected policy processes. Initially, email interview requests were sent to 32 experts identified by searching relevant organisations in the Finnish building energy efficiency sector, aiming to obtain as comprehensive picture of the processes as possible. The emails contained predefined questions based on our analytical framework, allowing either written or oral answers. The requests were sent to experts in following categories: Ministry of the Environment (5 people), building sector associations (10 people), building technology consultancies/entrepreneurs (6 people), large building owners (3 people), large construction companies (2 people), energy industry (2 people), energy efficiency agency (1 person), innovation agency (1 person), research organisation (1 person) and think tank (1 person).

Due to a limited response rate and receiving responses from multiple recipients that they do not know the policy processes in detail, we adopted a snowballing approach based on the two people that responded to know both or one of the processes. We contacted these respondents to find more people that were involved in or knowledgeable about the processes. This search process resulted in the identification of 10 people that were interviewed (see Table 3). Some people involved in the policy processes had retired and were unavailable for interviews.

Table 3: Interviews conducted for the policy process case studies

Case	Interviewees
Building regulations renewal, implemented in 2012	I1 Ministry of the Environment* I2 Energy efficiency agency Motiva I3 Association of Building Owners and Construction Clients (RAKLI) I4 University I5 Consultancy I6 Ministry of the Environment I7 Association of Civil Engineers
Renovation Strategy 2007-2017	I2 Energy efficiency agency Motiva I3 Association of Building Owners and Construction Clients (RAKLI) I6 Ministry of the Environment I8 National Agency for Education I9 Consultancy

	I10 Ministry of the Environment

* I1-I10 are codes assigned to specific interviews and used in the empirical section when interviews are directly quoted.

The interviewees were asked to describe the policy process in detail from their perspective, how agenda setting, policy formulation, implementation and evaluation took place and who the participating actors were and what they did. Prompts were provided using the intermediary functions in the analytical framework. Using interviews as main source of data, we analysed who were intermediating for transformation in the policy processes, how influential they were and what functions they carried out. Policy process narratives were constructed by reading each interview carefully and formulating as detailed case descriptions as possible. Interview data was complemented by searching supportive evidence from policy documents, stakeholder responses to a consultation regarding the first policy process case, and news articles.

4. Intermediation in two building energy efficiency policy processes

In Finland, similarly to many other European countries, 36% of greenhouse gas emissions and 40% of total energy use are associated with buildings; 20% from housing. Circa 70% of energy use in buildings is space heating. While progress in the energy efficiency of new buildings has been sufficient, the current challenge is 44% of the existing building stock, constructed in the 1960s-1980s, being in need of major renovation. (Official Statistics of Finland, 2018)

Finland's energy policy is governed by the Ministry of Economic Affairs and Employment, while the building regulations belong to the domain of the Ministry of the Environment. The origin of energy efficiency policies dates to 1975 and current policy objectives towards nearly zero energy buildings have been in place since 2000. With increased focus on climate change mitigation, the introduction of new measures and specifications became more intensive after 2008, comprising over 30 instruments in the following decade (Kern et al., 2017). Regulations have been the key instrument to target the energy efficiency of new buildings, predominantly the National Building Code, while the renovations of existing buildings have been addressed through voluntary agreements and some subsidies.

Transition intermediaries have been rather sparse in energy efficiency. The energy efficiency proponents in Finland have not organised into specific associations or lobby organisations. The public energy efficiency agency Motiva is seen by many as an impartial actor that may have made such a lobby organisation unnecessary. Motiva has functioned as a knowledge intermediary connecting the whole field of actors, and organising exploratory discussions feeding into policy formulation. Some interviewees claimed that energy efficiency is not as a specific theme as heat pumps or demand response, to trigger the formation of an association. Others saw it is best advanced in broader sustainability efforts, for example, via the Green Building Council of Finland that is part of an international network promoting sustainable building practices.

The two policy process cases present different dynamics of policy formation and implementation, with differing ways in which intermediation has become part of the policy processes. The following describes the background and policy cycle stages of these processes, focusing on intermediation.

4.1 Renewal of the energy requirements of buildings regulations

The process of renewing energy efficiency requirements in Finnish building regulations originated in 2008, after a change in government, and was influenced by the implementation requirements of the EU Directive on the Energy Performance of Buildings 2002/91/EC, entering into force in 2003. The Directive was partly implemented already in 2010 by tightening the requirements for walls and insulation in Finnish building regulations. However, the 2012 renewal of building regulations changed requirements for new buildings from u-values that dictated the limits to the performance of different building components to total energy calculation (e-values[1]). "*It was a large fundamental change and a political alignment*" (I1).

[1] The E-value represents a building's annual consumption of purchased energy, according to the heated net interior area (kWh/m^2a) and based on the standard use of the building type and weighted coefficients of the energy forms used. It considers the heating, ventilation, lighting and hot water. Energy sources have different co-efficients based on their use of natural resources: fossil fuels 1, renewable energy sources 0.5, electricity 1.7, district heating 0.7 and district cooling 0.4.

The active process of the policy renewal and its implementation took place during 2008-2012, with the activities of the Ministry of the Environment complemented by the Finnish Innovation Fund Sitra as well as a range of other actors taking on intermediary functions. The main stages of the policy cycle for building regulations are summarised in Figure 2.

[Insert Figure 2 here]

Agenda setting

Agenda setting for the legislative renewal started around 2008. There were slightly different interpretations between the interviewees regarding how this change came to the policy agenda. Three interviewees emphasised the demands of the EU Directive 2002/91/EC, one pointing how the change was already attempted unsuccessfully in the early 2000s. Two interviewees mentioned that the building automation services sector argued that replacing the component specific u-values with the overall energy performance would promote more effective construction. This was connected to discussions in 2009 on staggering the property tax based on energy efficiency and heating sources (MoE, 2009). Ultimately, the Ministry of the Environment (MoE) contracted the Helsinki University of Technology to develop a first calculation method to assess the total energy use of a single building, creating an initial knowledge base around total energy assessment.

During agenda setting, a group of five people comprising university and industry actors had brought the current policy problems to the attention of Minister of Housing Jan Vapaavuori. They suggested that a one-number-measurement for energy performance (e-value) would trigger innovations. Minister Vapaavuori took their arguments under serious consideration and played a significant role in the policy process by showing direction and setting goals. The interviewees remarked that the Minister had the necessary courage to carry out the reform and did not relent under political pressure.

The Finnish Innovation Fund Sitra, a systemic intermediary, also played a central role in getting the Ministry to advance the regulatory change based on e-values. They, for example, prepared projects to ground the idea to include renewable energy in building regulations and to produce contents to new building regulations and the total energy assessment scheme: *"It was in a way a very good stepping stone, from where it was easy to go forward. In that sense the work was worth gold…*" (I7). Sitra, thus, took a role of intermediating for system change.

The novel proposal required, however, a change in the thinking of civil servants in the Ministry: "*There was confusion in the Ministry, because the people in the Ministry did not in the beginning believe that this kind of thing would be possible, because since the 1970s there had been building regulations that dictated how to build particular parts and components of the building"* (I4). The Ministry funded a consultancy project, conducted by the technical research institute VTT and EQUA Simulation consultancy, to assess realistic methods and standards to be set by the regulation. This convinced the Ministry on the technical plausibility of the e-value method.

Policy formulation and decision-making

Policy formulation took place during 2009-2012. Several interviewees mentioned that the policy formulation was strongly in the hands of the Ministry. The revised EU Directive on Energy Performance of Buildings 2010/31/EU that highlighted cost-optimal solutions influenced this stage. The Directive also drew attention to 'high-efficiency alternative systems', such as decentralised energy supply systems based on energy from renewable sources, co-generation, district or block heating/cooling, and heat pumps. The Ministry appointed a large, circa 20-person working group that included Sitra, industry and different associations, such as the Finnish Real Estate Federation.

Also, in this stage, the interviewees regarded Sitra's role as significant in knowledge capacity as well as providing funding for projects supporting policy formulation. Sitra had an ongoing Energy Programme during 2007-2012 with resources to fund a range of activities. The Ministry and Sitra coordinated their project funding decisions. As Sitra had more resources to allocate, they funded the development of calculation methods. This coordination was considered to result in intense and good cooperation between Sitra and the Ministry. The ERA17 Action Programme on Energy Smart Built Environment,

launched in 2010 by the Ministry together with Sitra and the Finnish Funding Agency for Technology and Innovation Tekes, further tightened the collaboration between different actors.

The interviews indicated that active discussions took place among the construction industry (RT), the Finnish Real Estate Federation, the Finnish Association of Building Owners and Construction Clients (RAKLI) and the Energy Industries (ET). While there was consensus between various actors in the big picture, promoting differing interests was visible in the consideration of details. Many established building sector actors, while rhetorically supporting energy efficiency and climate change, were still opposing some parts of the regulatory change, resulting in a lower energy efficiency ambition than initially sought. One interviewee phrased this strongly: "*Well, there is not a lot of nice to say about that process. Those organisations…they don't want to improve building energy efficiency or develop the sector, they just want to picket their own market share and role*" (I5).

Another interviewee mentioned that organisations, like RAKLI and the Association of Building Inspectors (RTY), were very careful – even 'tending to push the breaks' – and it was only selected individual members or member companies of these industry organisations that promoted the change. In their memorandum to the Ministry, RAKLI stated that "the cost-efficient energy efficiency measures have already been accomplished" and "the savings potential has not been properly verified" (Rakli, 2012). Correspondingly, RTY raised the concerns over "over-renovating" buildings and risks pertaining to rising costs of renovations that might in the long-term lead to postponing of necessary renovations (RTY 2012). In particular, the manufactures of electric heating cables and other electricity industry actors forcefully opposed the regulatory change due to its negative impacts on the use of electricity as a heating source, resulting even in false claims about the new regulation, for example, that it applied to all house owners – not just new buildings (Tekniikka & Talous 2011). They opposed the high co-efficient placed on electricity in comparison to other heating sources. In the memorandums, even the constitutional legitimacy of the Act was questioned, as it might limit individual freedom regarding the choice of heating. Simultaneously, the HVAC Association of Finland (SuLVI) and consultants were largely supportive, as they were likely to benefit from the regulatory change.

Implementation

Implementation started in July 2012 after the new Decree on building energy efficiency was approved. It made changes to Part D of the Building Code. Emphasis was particularly placed on training. "*When all sector organisations are part of the preparation, basically all should be informed about it*" (I4). The Ministry was active in developing guidelines, handling communications and conducting training events for building inspectors but it had limited resources, indicating perhaps a need for a dedicated intermediary to adopt a knowledge gathering and dissemination role. The HVAC Association of Finland (SuLVI) was described as a particularly significant actor in training, organising intensive training regarding e-value calculation to build new expertise. In addition, other organisations, such as the Finnish Association of Architects (RAFA), the Finnish Association of Civil Engineers (RIL), and the Finnish Construction Managers and Engineers (RKL) adopted their typical role in educating their members. An interviewee noted that they "*did a good job"* at this (I5).

Sitra remained active in the implementation stage. It organised a project to launch the total energy calculation scheme in connection to the annual national Housing Fair, and installed building boards to each house in the Fair. Sitra's Energy Programme was also vital.

The government energy efficiency agency Motiva assisted in the implementation, although it did not play a role in the preparation of this regulatory change. Motiva organised discussion events with a broad range of building sector actors and stakeholders and initiated informal discussions to feed into policymaking. It was regarded as an impartial intermediary that collects different viewpoints together.

In addition, other actors, such as design offices creating fact sheets and customer events, and city officials taking leadership roles to require changes in advance of that required by the new regulation had an important impact on implementation.

Evaluation and impact

No systematic evaluation of the policy was carried out according to the interviews, i.e. the evaluation stage did not take place, at least not formally. Yet, the interviewees saw that the policy change created

new learning and influenced the design of buildings. As a result, energy simulations are now carried out for each building project, not just for energy efficiency but also to avoid over-heating. In addition, the policy change had a significant impact that more energy-efficiency construction products have been developed: "*Development got going, when all products are in a little bit of competition with each other… regarding energy efficiency when calculating total energy performance*" (I1).

The building regulations were revised again in 2018 but the level of change in the requirements was considered quite modest as there was no apparent political drive or intermediary push at that time.

4.2 Renovation strategy

The Renovation Strategy was initiated in 2007 with an aim to promote proactive property maintenance and repair culture to save costs and meet sustainable development goals (MoE, 2016). It included an implementation and development plan until 2017, comprising thirteen specific measures resulting in a wide range of informational measures on renovation and avoiding energy loss. Energy efficiency was a part of the renovation strategy, but it was not at the core of the activity. The vision for the strategy states among other things that: "*The energy efficiency and accessibility of the building stock have significantly improved as a result of extensive repair activities*" (MoE, 2007, p. 17). In addition, the improvement of building energy efficiency was one of the specific measures to be delivered, for instance, via improving real estate management, assessment and measurement of energy use in properties, new service models, and improved policy instruments.

The agenda setting for the strategy began in the early 2000s, but intermediation and stakeholder involvement did not really begin until the policy formulation stage, being strongly in the hands of the Ministry of the Environment. The main stages of the policy cycle for the renovation strategy are summarised in Figure 3.

[Insert Figure 3 here]

Agenda setting

Agenda setting for the renovation strategy started already in the early 2000s, when a large part of the building stock constructed in 1960s and 1970s began to demonstrate renovation needs. An interviewee recounted that there were no specific regulations for the renovation of buildings at the time. Only the Land Use and Building Act stated that, in renovations and significant repairs, the regulations for new construction should be followed as required. The renewal of the Land Use and Building Act in 2000, promoting systematic property maintenance, was considered to be a key driver behind the renovation strategy. No specific intermediation actions were noted to take place at this stage by the interviewees.

Policy formulation and decision-making

Policy formulation took place during 2005-2007. The ministry set a preparation group in 2005. It included a broad range of actors from the building and property sectors: representatives from the Housing Finance and Development Centre (ARA), the Finnish Heritage Agency, VTT Technical Research Centre, Building Inspection Association (RTY), Confederation of Finnish Construction Industries (RT), the Finnish Real Estate Management Federation, the Association of Finnish Local and Regional Authorities, the Finnish Association of Building Owners and Construction Clients (RAKLI), and the Finnish Real Estate Federation. Unlike in our first case study, the process did not involve political steering, because political actors were missing from the process. Intermediation activities by the Ministry appeared successful in realigning the objectives of diverse actors to back up common action for energy efficiency as part of renovation.

Implementation

The implementation of the strategy was conducted during 2007–2017, being intermediated by the Ministry and four other organisations towards building and renovation sector stakeholders. The main emphasis was put on the improvement of education and training of professionals. First, the Ministry of Education and Culture (MEC) set the *Education Commission for Construction Industry and Building automation* with the task of advancing coordination between education in all levels and work life, by

assessing the development of professional education and making proposals for its further development. The Commission was composed of different regime actors and it was given a special task to follow and implement measures concerning the renovation strategy. The Commission facilitated the addition of new renovation knowledge to the further education of teachers in secondary education. For example, they established three new specific education programmes, undertaken by circa 40 teachers, resulting in increased know-how of the teachers and, ultimately, of new renovation professionals. In addition, the Commission organised seminars and conducted surveys regarding the status of renovation practices.

Second, the energy efficiency agency Motiva played an intermediary role by both advancing training in practice and via its long history of energy efficiency programmes. It organised informal discussion events, considering a broad variety of actors in the building sector and its stakeholders. It had a role to play in information guidance advancing energy efficiency in renovations.

Third, the Finnish Real Estate Management Federation, representing real estate managers, and the Finnish Real Estate Federation, comprising housing corporations and other property owners as members, were identified as potential intermediaries in the implementation. For example, the Real Estate Federation was facilitating the implementation of systematic real estate management in housing corporations and had a list of KIPI-cards for different topics in the strategy, which are widely used by the professionals in the field.

Evaluation and impact

The strategy process formally ended in 2017 but some of the activities were extended until autumn 2018. No intermediation beyond that taken by the Ministry itself was described in connection to the evaluation. Overall the process of strategy preparation and implementation was described as “positive” (I8) and “really good cooperation” (I3). A civil servant from the Ministry stated that: “*It had a really good spirit with all parties and a sense of working together. Everyone felt that now we are doing an important thing together”* (I10). Many interviewees also described the strategy as impactful, for example, via improvements achieved to the viewpoints, communications and collaborations between participants, reaching beyond the strategy process.

Subsequently to this policy process, in 2014, energy efficiency in renovation was addressed in building regulations.

5. Discussion

Our empirical analysis of intermediaries advancing transitions in the public policy interface, in two building energy efficiency policy processes, shows how technical processes can be governed with the lead of administration. In the two Finnish cases, specific intermediary actors external to the ministry in charge had a relatively limited ‘upward’ influence. What is interesting in our case studies is that the Ministry of the Environment itself conducted much intermediation in the processes. It expanded beyond the traditional ministry role, for example, by coordinating knowledge production via different projects and mediating broad-based consultations. In both policy processes, it played an important role in aggregating expectations from the network of actors and creating a common voice between these actors, also getting on board the actors’ views on the design of policy instruments. This intermediation undertaken by the Ministry, and the trust placed by stakeholders to let it do so, may be explained by Finland’s tradition in consensus-oriented policymaking (cf. Ruostetsaari, 2017).

The centrally governed intermediation was complemented by the Finnish Innovation Fund Sitra that has played an important systemic intermediary role in building regulations’ renewal throughout the process. During agenda setting and policy formulation, Sitra has funded projects that have fed into policy design and supported the broad policy approach with knowledge capacity. It has conducted the functions of advocating for new visions, influencing preferences for new policy options and the design of the renewed regulations. While our empirical analysis does not recognise Sitra’s role in facilitating experimentation, in previous research, its activities pertaining to this function have been shown to be influential (Kivimaa, 2014).

In our case studies, external intermediary actors have been more important in influencing 'downward' intermediation of policy to stakeholders. Important translating and 'policy sales' functions have been conducted by the HVAC Association of Finland (SuLVI) and a government energy efficiency agency Motiva (as regime-based transition intermediaries) in the implementation stage. In addition, an Education Commission established by the Ministry of Education and Culture has been crucial in translating the renovation strategy by establishing new training for secondary education teachers in this field. Motiva's role as an intermediary was more tentative and indirect in both processes.

Table 4 portrays our findings against the analytical framework introduced in Section 2. In the Finnish case, intermediation for three functions in agenda setting can be identified: the aggregation of expectations, creating a common voice and advocating for new visions. Facilitating experimentation is less explicit but may be explained by rather advanced knowledge of the technologies and management processes required. Similarly, for policy formulation, three intermediation functions appear in our empirical cases: strengthening the common voice and influencing preferences for policy options and the design of policy instruments. The aggregation of expectations and facilitating experimentation are less visible in this stage. In the implementation stage, coordinating, translating and interpreting, and selling policy to target recipients have been important intermediary functions. Enabling access to public finance is not explicit, probably due to these policy processes not involving financial instruments that are otherwise present in the policy mix (cf. Kern et al., 2017). Trust building and conflict resolution are not visible in our material but may have taken place in a smaller scale. Intermediation in the evaluation stage has been least explicit, not least because proper evaluations have not taken place by external actors.

Table 4: Findings regarding intermediary functions in the two policy process cases

	Agenda setting	***Policy formulation and decision-making***	***Implementation***	***Evaluation***
Building regulations renewal	*Aggregating expectations, knowledge and learning - Motiva* in a general sense, but not specific to the two policy processes *Creating a 'common voice'* – no external intermediary, achieved by ministry coordination *Advocating for new visions* – partly via *Sitra*'s energy programme	*Strengthening the 'common voice'* – no external intermediary, achieved by ministry coordination *Influencing preferences for policy options - Sitra*'s energy programme as supportive force, (Electric Heating Forum and Finnish Energy Association as contradicting) *Influencing the design of policy instruments* (regulation) – achieved mostly by ministry coordination but also background projects funded by *Sitra*	*Coordinating policy implementation*, mainly via ministry coordination and building inspection *Translating and interpreting policy* – training activities by *SuLVI* and *Motiva, Sitra* housing fair project *'Selling the policy' to its target recipients - Sitra* and *Motiva* via their communications activities and different associations (especially SuLVI) to their members	*On-the-ground experimentation providing policy feedback* – happened but uncertain if there was an intermediary aggregating the policy feedback
Renovation strategy	*Aggregating expectations, knowledge and learning - Motiva* in a general sense, but not specific to the two policy processes	*Creating/strengthening the 'common voice'* – no external intermediary, achieved by ministry coordination *Influencing the design of policy instruments* (as part of strategy) –achieved by ministry coordination	*Coordinating policy implementation*, mainly via ministry coordination and building inspection *Translating and interpreting policy* – training activities by *Education Committee, Motiva*, Real Estate Federation, and Real Estate Management Federation *'Selling the policy' to its target recipients - Motiva* via its communications	*Aggregating different stakeholder perspectives* - mainly ministry coordinated

			activities and the different associations to their members	
Functions not visible in case studies	*Brokering relevance for policy discourses* *Facilitating experimentation*	*Aggregating expectations, knowledge and learning* *Facilitating experimentation*	*Enabling access to public finance* *Trust building and conflict resolution*	*Intermediating for broader policy evaluations* *Conducting alternative policy evaluations*

The two policy processes examined – while dissimilar in policy design (regulation vs. strategy) and context (new vs. existing buildings) – are surprisingly similar in terms of intermediation. The lack of extensive external intermediation can be explained, at least partly, by the technical nature of the policies and a strong and active role of the Ministry of the Environment in both policy processes. The Ministry has effectively undertaken many intermediary functions itself, leaving few gaps for external intermediaries to fill. This applies specifically to the policy formulation stage, whereas in implementation the role of 'translating' intermediaries has been important. In both processes, intermediating 'downwards' has been carried out by three categories of actors: the Ministry, energy efficiency agency Motiva, and associations targeting their own membership base.

The process of renewing building regulations' energy calculation also benefitted from the strong championing role (cf. Klerkx and Aarts, 2013) by the then Minister of Housing. The vision advocated by a group of policy entrepreneurs and the systemic intermediary Sitra found an important ally from the Minister, the former being better placed to channel the vision and learning upwards to the agenda setting and policymaking processes.

Interestingly, the number of intermediary actors in the building energy efficiency interface in Finland is in stark contrast to the high number of intermediaries in the UK building energy efficiency domain (Kivimaa and Martiskainen, 2018). Unlike in the UK, only state-affiliated agencies and sectoral member organisations were identified as intermediaries in the policy interface. Instead, the UK policy landscape showed specific niche intermediaries and a broader range of charities, social enterprises and public-private networks operating in the interface of policy and desired low-energy housing transitions (Kivimaa and Martiskainen, 2018). Possible explanatory factors are differences in the policy making culture and the political attention given to energy efficiency transitions.

We argue that the relevance of intermediation in the policy interface is likely to fluctuate not only depending on the policy cycle stage but also the level of political interest in the process: *Intermediating new visions and learning upwards towards policymaking is particularly important when political interest for change is low, while intermediating adopted transition-oriented policies to stakeholders is still needed even when political attention is high*. We argue that the former is more likely to face the counter force of intermediaries working to preserve status quo, which has been shown in an analysis of environmental and social protection policies (Rivera et al. 2009). Indeed, one of our empirical cases highlights an element relatively little acknowledged in transition studies, by showing explicit intermediaries that work to slow down or prevent transformation. While in general, the reluctance of many incumbent actors to – at least initially – support transitions is well acknowledged (e.g. Geels, 2014; Markard 2018), little research has paid specific attention to how these actors are organised and their interests intermediated. Our policy process case study illustrates that intermediation to prevent significant policy change can range from inaction or disinterest to active public campaigns containing even false claims about the proposed policy. However, our research does not reveal whether these kinds of intermediaries only oppose the proposed policies or provide alternative visions of the emerging transitions. To create a more nuanced understanding of when and what kind of intermediation is useful for transitions in general, and policy change in particular, future research needs to better address intermediation working on both advancing and hindering transformation. This also links to the established forms of power in policymaking structures and so-called 'power elites' (Ruostetsaari, 2017) as well as the politics of transitions (e.g. Geels, 2014).

While the policy processes analysed here originally received enough political attention to account for transition, the situation has changed since. Despite the relatively high political attention in Finland on energy transition and climate change, building energy efficiency has not been at focus much of the

remaining decade. New momentum has been generated by the new government, formed in spring 2019, and new policy processes have been initiated with much more active engagement of Motiva and other potential intermediaries. There is a clear need for intermediary support to maintain transformative policy change in this area, but it is unclear who should take such a role.

6. Conclusions

This article developed and used a novel analytical framework to analyse how sustainability transitions are intermediated in the policy interface. Based on literature review, it identified 4-5 key intermediary functions at each of the four stages of a policy cycle. The aim was to provide missing insights on transition intermediary functions pertaining to potentially transformative policy processes, going beyond knowledge brokering.

An in-depth, qualitative empirical analysis of two building energy efficiency policy processes in Finland, showed evidence of how some of these intermediary functions were applied in practice, while some were not evident in the empirical cases. In particular, intermediary functions related to creating a common voice, aggregating stakeholder expectations, influencing preferences for policy options and policy design were identified as important upward functions. In turn, coordinating policy implementation, translating and interpreting policy, and selling policy to target recipients were the observed downward functions.

From our results, we can infer that:

(1) Also government ministries can conduct intermediary functions that go beyond their typical roles, but a strong role by public administration may narrow the space for external intermediaries in policy processes.
(2) To have influence, new policies require policy ‘sales’ and translation (via learning and training) by a range of actors, such as energy agencies and professional associations.
(3) A systemic intermediary can significantly raise the ambition level of a proposed policy change, especially if it brings knowledge capacity and financial resources into the process, making policy formulation more informed and attuned to transitions.
(4) Transition intermediaries counter other intermediaries who aim to preserve status quo and create strategies to slow down or halt transformational policy change. The position of these intermediaries may change over time, sometimes even during the policy cycle, into transition supporting intermediaries.

To conclude, we argue that, in order to accelerate transitions, we need to be better able to recognise obstacles to transitions, including intermediaries preventing transitions, to create strategies to overcome these obstacles. Based on our analysis, we postulate that the need for intermediary action in occasions and times when national and local governments actively advance policy differs significantly from the intermediation and intermediaries needed when policy attention is low.

Our empirical analysis was the first application of the analytical framework. Due to the case-study analysis and its context dependence, in our case the consensus-based decision-making culture in Finland, further empirical investigation is needed on how transition intermediation is conducted in the policy interface in other contexts. Our analysis also shows that too little attention has been paid, both conceptually and in real life, in intermediation in ex-post policy evaluations.

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Figure captions:

Figure 1: Potential functions of intermediation in the policy interface (Source: authors own illustration)
Figure 2: Intermediation in the renewal of building regulations
Figure 3. Intermediation in the Renovation Strategy Process